

WHAT IS CLAIMED IS:

1           1.     A method of analyte identification comprising:  
2                 receiving data from a plurality of sensor sites formed on an integrated circuit,  
3     wherein a sensor material is constrained at the sensor site and has regions of a nonconductive  
4     organic material and a conductive material, and in the presence of an analyte, the sensor  
5     material has measurable changes in an electrical property;  
6                 storing analog weights from the plurality of sensor sites; and  
7                 using the analog weights to identify an analyte.

1           2.     The method of claim 1 wherein the analog weights are stored in an  
2     analog memory.

1           3.     The method of claim 1 wherein the analog weights are stored using a  
2     digital memory.

1           4.     The method of claim 1 wherein the analog weights are stored using  
2     nonvolatile analog memory cells.

1           5.     The method of claim 1 further comprising:  
2                 perturbing the analog weights by a perturbation of equal magnitude.

1           6.     The method of claim 1 further comprising:  
2                 measuring an output error using a result of perturbing the analog weights.

1           7.     The method of claim 5 wherein the perturbation has a random sign.

1           8.     The method of claim 1 wherein the electrical property is resistance.

1           9.     The method of claim 1 wherein the electrical property is capacitance.

1           10.    The method of claim 1 wherein the electrical property is impedance.

1           11.    The method of claim 1 wherein the analog weights are stored in an  
2     analog form in a plurality of floating gate device memory cells.

1                    12.    The method of claim 1 wherein using the analog weights comprises  
2    comparing the stored analog weights against a set of analog weights for previously identified  
3    analytes.

1                    13.    The method of claim 12 wherein using the analog weights further  
2    comprises:  
3                    identifying the analyte as one of the previously identified analytes when the  
4    stored analog weights are similar to the set of analog weights of the previously identified  
5    analyte.

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